RESEARCH

The effectiveness of a peer-mentored older adult fitness program on perceived physical, mental, and social function

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Keywords
Peer mentors; peer mentoring; older adults; elderly; physical fitness; exercise; research; exercise intervention; physical fitness intervention; SF36; physical function; social function; mental health; well-being.

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Received: June 2008;
accepted: September 2008

doi:10.1111/j.1745-7599.2008.00393.x

Abstract

Purpose: The purpose of this research was to compare changes in perceived physical, mental, and social function measured by the Short Form-36 (SF36vr2) in a group of older adults who were trained by peer mentors (PMs) versus a similar group trained by qualified kinesiology student mentors (SMs).
Data sources: We conducted a two-arm repeated measures longitudinal intervention and collected data for 87 PM and 44 SM participants. Pre- and post-training subscale scores were computed for all eight subscales and the two summary physical and mental component scores. The percentage differences in the 10 scores were used as the response variables.
Conclusions: After a 14-week physical fitness intervention, perceived physical, mental, and social functioning improved significantly ($p < .05$) for the PM group, but not for the SM group ($p > .06$). Thus, older adults who participated in a physical fitness program with peer support perceived (a) overall improvement in physical and mental well-being; (b) better social functioning, (c) enhanced ability to carry out physical and emotional roles, (d) improved general health, and (e) increased level of vitality. Thus, we conclude that peer-mentored exercise programs for older adults are superior to programs mentored by young professionals and may lead to increased adherence.
Implications for practice: Nurse practitioners routinely prescribe exercise while educating older adults about the benefits of an active lifestyle; however, older adults often remain sedentary and exhibit poor adherence to exercise. One potential solution is to use peer support. Two factors that can improve adherence are availability of structured exercise programs for the older adult and peer mentoring.

Introduction

In the primary care setting, treatment goals for elderly clients focus on function. The maintenance of overall functioning is essential for aging individuals in order to remain independent, prevent the development of various diseases and chronic illnesses, reduce the risk of fall-induced injuries, and increase overall mood and satisfaction with life. Nurse practitioners (NPs) and other providers recognize that physical activity is key to preserving physical functioning for activities of daily living (Toraman, Erman, & Agyar, 2004). NPs routinely prescribe physical activity and educate older adults about the associated physical, cognitive, and psychosocial benefits of an

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active lifestyle (Ho et al., 2007; Kannel & Sorlie, 1979; Sallo, Rimm, Harro, Karelson, & Viru, 1997; Stephens, 1988; Wankel, 1993).

However, knowledge alone does not change behavior; individual- and community-based health education programs are often ineffective in promoting lifestyle changes (Centers for Disease Control and Prevention, 2001). Older adults who participate in exercise programs are more likely to maintain physical functioning than those participating in health education programs (LIFE Study Investigators, 2006). Moreover, structured physical activity enhances quality of life and perceived physical, social, and emotional functioning (Ho et al., 2007). The purpose of this study was to document the impact of structured exercise on overall functioning in a group of older adults trained by peer mentors (PMs) compared to a similar group trained by qualified kinesiology student mentors (SMs).

Background and significance

The role of the NP is to help promote, maintain, and restore health of individuals, families, and communities in a cost-effective and efficient manner. To do this, NPs must be aware of the impact of inactivity on health and aging, as well as the overall effect on the healthcare system.

The American population is aging, inactive, and in declining health. The National Center for Chronic Disease Prevention & Health Promotions (2007) projects a doubling of adults age 65–84 and a quadrupling of those age 85 and older by the year 2040. Over 87% of adults aged 65 or older and 94% aged 75 or older are inactive, as they do not engage in vigorous physical activity for at least 20 min three times a week (Centers for Disease Control and Prevention, 2007; Taylor et al., 2004). Inactive older adults account for twice as much medical costs as compared to their active counterparts and are responsible for more than one third of the total healthcare expenditures in the United States ("Physical activity," 2002). These expenditures are projected to increase by 25% by 2030 (National Center for Chronic Disease Prevention & Health Promotions). Clearly, improved physical activity for older adults would have a major impact on the health of this population and the associated healthcare costs.

Physical activity guidelines

To promote physical activity and improve overall functioning in older adults, NPs must be aware of current guidelines and evidence-based practices. Physical fitness guidelines for older adults include routine weight-lifting exercise to enhance muscular strength, along with aerobic exercise to promote and maintain overall health (Haskell et al., 2007; Nelson et al., 2007). When prescribing physical activity for older adults, the goal is to promote physical activities that (a) emphasize moderate-intensity aerobic and muscle strengthening, (b) maintain or increase flexibility and balance, (c) reduce sedentary behavior, and (d) manage health risks such as fall-induced injuries (Nelson et al., 2007).

Peer mentoring

Despite the numerous benefits of physical activity on preventing and managing several health conditions, regular engagement in physical activity decreases with age (Rhodes et al., 1999; Stephens & Caspersen, 1994). Although NPs and other healthcare providers prescribe physical fitness to improve and maintain overall function, several barriers exist. The most common barrier is the lack of knowledge or experience to exercise alone. Therefore, older adults often require proper consultation and supervision from an exercise specialist or an experienced peer.

Peer mentors are nonprofessional individuals who receive quality preparation and thus have a unique resource to offer to others with similar characteristics (Medvene, 1992). If adequately prepared, peer mentors are capable of providing basic counseling necessary to help others (Kirkpatrick & Patchner, 1987). Peer mentors are effective in various clinical settings across diverse health conditions, such as arthritis (Lorig et al., 2001), anxiety and heart disease (Parent & Fortin, 2000), breast cancer (Ashbury, Cameron, Mercer, Fitch, & Nielsen, 1998), HIV infection (Broadhead et al., 2002), frailness in the elderly (Ezumi et al., 2003), burns (Williams et al., 2002), and diabetes (Joseph, Griffin, Hall, & Sullivan, 2001).

Among older adults, peer mentors are empathic and respectful toward one another (Bratter & Freeman, 1990). Through positive role modeling, they can dispel the stereotypes of aging more effectively than younger professionals (Bratter & Freeman). Consequently, the application of a peer-mentored exercise program may be more appealing to older adults and may better foster adherence to regular physical activity.

Purpose

The purpose of the study was to document the impact of structured exercise on overall functioning in a group of older adults trained by PMs compared to a similar group trained by qualified kinesiology SMs. We hypothesized that older adult exercise program participants who were mentored by peers would achieve equivalent changes in self-reported physical, mental, and social function as measured by the Short Form-36 (SF-36vr2) compared to other older adults receiving exercise training by qualified young kinesiology professional trainers.

Methods

For this study, we conducted a two-arm repeated measures longitudinal experiment. We randomized participants into arms of a 14-week physical fitness program with either peer mentors (PM group) or young professional kinesiology student trainers (SM group). The institutional review board at the University of Texas at El Paso approved this research project.

Setting

Training and implementing the intervention occurred at the University of Texas at El Paso Fitness Research Facility. The first author, an expert in kinesiology and exercise program implementation, designed the intervention program based on current American Heart Association and American College of Sports Medicine recommendations (see Haskell et al., 2007). Trained and experienced program supervisors managed the day-to-day program operation. The first two authors supervised data collecting and recording.

Sample

We used snowball sampling to recruit older adults. Inclusion criteria included healthy adults older than 60 years who spoke English and provided a physician release form for program participation. Excluded were older adults who had health conditions that prevented participation in a fitness program or were unable to complete the 14-week fitness program. A power analysis using the one-sided, two-sample *t* test indicated that minimum sample sizes of 76 PM and 38 SM participants (using a 2:1 ratio) were needed to detect a significant difference between the two groups with a medium effect size of .5 at $\alpha = .05$ with β set at .20.

Procedure

Starting February 2006 and ending December 2007, we implemented the physical fitness intervention program in two stages. The purpose of stage 1 was to identify and train 30 older adults as peer mentors. The training lasted 30 weeks and is summarized in Table 1. Student mentors were senior level kinesiology students trained as professional trainers. These students were either certified or eligible for certification as professional trainers upon graduation. Prior to starting stage 2, the first author validated the ability of peer and student mentors to lead the physical fitness intervention by observing mentors as they trained undergraduate student volunteers. The use of one person to validate skills prevented potential problems with interobserver reliability.

In stage 2, 60 older adults (N = 31 men and N = 29 women; mean ± SD age: 68.7 ± 6.1 years) were recruited from the local community to become the first cohort of participants. They were randomly assigned to one of the two groups: (a) an SM group (N = 15 men and N = 15 women) or (b) a PM group (N = 16 men and N = 14 women). Prior to the program, written informed consent was obtained, and participants were informed that they would be assigned to work either with SMs or with PMs. Participants were blind to group assignment until the first program session.

The SM and PM groups engaged in identical 14-week intervention program with three 75-min training sessions per week. To avoid accidental exposure of control group to peer mentors, SM and PM groups met on different days of the week. Exercise sessions focused on the improvement of participants' cardiovascular fitness, muscular strength, muscle mass, power, balance, and flexibility. Activities included (a) resistance training exercises using resistance training machines, weights, dumbbells, Swiss balls, and medicine balls; (b) cardiovascular activities using stationary equipment (i.e., treadmill, elliptical machine, and stationary bike); (c) balance exercises using wobble discs and balance boards; and (d) stretching to improve upper and lower body flexibility. Each exercise session followed a detailed plan that was part of a thoroughly elaborated

Table 1 Summary of 30-week peer mentor preparation program

Week	Main focus of preparation
1–14	• Participated in three 75-min physical fitness training sessions weekly • Learned names and correct execution of a variety of exercises focusing on cardiovascular fitness, muscular strength, muscle mass, power, agility, balance, and flexibility • Supervised by kinesiology student trainers on one-on-one basis • Attended monthly educational lectures by first author on general aspects of aging, health, and fitness
15–27	• Continued three 75-min physical fitness training sessions weekly received group supervision • Developed mentoring skills by pairing up with one another and role playing as trainers and participants • Demonstrated exercises, assisted with exercise set-up, observed for correct execution, provided motivation to one another • Attended monthly educational lectures by first author specific to physical training and mentoring
28–30	• Practiced peer mentoring with a group of unfamiliar kinesiology student volunteers • Passed competency-based assessment in physical fitness training and peer mentoring

training program with progressively increasing exercise intensities. All subjects followed the same program (i.e., same exercises and number of sets and repetitions); however, training intensities were individualized.

For each respective group, the mentor role was the same. Mentors were instructed to follow the prescribed exercise program, guide participants through all exercises, assist them with the execution of movements, such as spotting during balance and weight training, and encourage them to greater effort. In general, the mentor to participant ratio was 1:1 within both groups. The researchers did not control the pairing of the participants with mentors; however, we ensured that all participants were paired with a mentor and that mentors were not left without a participant. Participants were allowed to switch mentors from session to session. Conversely, neither student nor peer mentors were allowed to refuse partnering with any given participant.

Trained and experienced program supervisors were responsible for day-to-day oversight. Supervisors' duties included monitoring program safety, ensuring proper execution of the prescribed training session, and answering questions from mentors. One program supervisor was present for any given SM or PM group session and was instructed to intervene with the mentoring only if necessary (i.e., observing unsafe exercise execution or improper spotting).

In the fall of 2007, a second cohort of 89 participants (N = 32 men and N = 57 women; mean ± SD age: 69.4 ± 6.2 years) was recruited and randomly assigned to either the SM (N = 8 men and N = 16 women) or the PM group (N = 24 men and N = 41 women). This second cohort of intervention participants completed the same 14-week intervention as the first cohort a year earlier. Participants in the PM group were trained by the same group of peer mentors, while the SM group was trained by a different cohort of qualified undergraduate kinesiology students.

Data on physical, mental, and social function of both cohorts were assessed using the SF-36vr2 health survey instrument, prior to and immediately following the 14-week intervention program. Between the two cohorts, there were no differences in the pretest component and subscale scores ($p > .05$). Therefore, cohort scores were combined, resulting in a total sample size of 149, with 95 intervention participants in the PM and 54 in the SM group. Baseline descriptive characteristics of all intervention participants and peer mentors are presented in Table 2.

Data collection method

For this study, we measured overall functioning defined as perceived physical, mental, and social function using the SF-36vr2, a widely used measure of quality of life and overall functioning in clinical and research settings (Ware, n.d.). It provides two summary scores (physical component summary or PCS and mental component summary or MCS) and scores for eight individual scales. PCS is a composite of physical functioning (PF), role physical (RP), bodily pain (BP), and general health (GH) scales. MCS includes vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH) scales.

Multiple studies in the past decade have repeatedly demonstrated reliability using test–retest and internal consistency methods ($\alpha \geq .80$ for subscales and .90 for component scores) and content, concurrent, criterion, construct, and predictive validity (Ware, Kosinski, & Dewey, 2000; Ware, n.d.). Norm-based scoring allows comparison across general and specific adult populations including the elderly (Ware et al.).

Statistical analysis

Data on perceived overall physical, mental, and social function collected by the SF-36vr2 health survey instrument were analyzed using the Statistical Analysis System (SAS), version 9.1.3. Pre- and posttraining subscale scores

Table 2 Mean (±SD) descriptive characteristics of peer mentors, the student-mentored, and the peer-mentored group participants at baseline

Group	N	Age (years)	Height (cm)	Body mass (kg)	Body mass index (kg/m^2)
Peer mentors					
Males	15	70.4 ± 5.9	174.5 ± 6.7	83.6 ± 11.4	27.4 ± 2.8
Females	15	66.8 ± 5.3	162.3 ± 5.0	70.0 ± 7.7	26.6 ± 3.1
SM group[a]					
Males	23	69.4 ± 5.8	174.5 ± 7.9	91.1 ± 18.2	29.8 ± 5.0
Females	31	69.1 ± 7.2	159.5 ± 7.6	69.8 ± 12.7	27.6 ± 5.6
PM group[a]					
Males	40	69.6 ± 6.4	173.9 ± 4.9	90.4 ± 14.2	29.9 ± 4.3
Females	55	68.1 ± 5.5	161.1 ± 6.3	69.4 ± 11.9	26.8 ± 4.8

[a]Presented SM and PM group data are combined data from the first and second cohort of intervention participants.

were computed for all eight subscales and the two summary physical (PCS) and mental (MCS) component scores. The percentage differences in the 10 scores were computed as 100(Postscore − Prescore)/(Prescore) and were used as the response variables.

Once pretest scores were calculated for each cohort, a two-sample *t* test was used to compare cohorts in terms of the two summary and eight subscale mean scores. Analyses revealed no statistical differences between the pretest values of the two cohorts of intervention participants (*p* range from .08 to .99). Therefore, data from the two cohorts were combined to improve statistical power. Later, to investigate differences between the SM and the PM groups, the two-sample *t* test was used. In addition, for each mentor group, the one-sample, one-tailed *t* test was performed to test if the mean percentage difference was significantly higher than 0 (indicating an improvement from pre- to post-training). All analyses were conducted at the .05 level of significance.

Results

A total of 131 participants completed the study. The scores from the 18 participants who did not complete the intervention were dropped from the data analysis. When investigating the reasons for dropouts, we discovered that the majority were explained by individuals experiencing a substantial life change (i.e., moving away from city, physician's recommendation to discontinue, undergoing a surgical procedure) rather than program dissatisfaction or loss of interest in the program. The breakdown of the dropouts per intervention group revealed that retention of intervention subjects was higher in the PM group across the two cohorts, as 87 of the 95 participants (91.6%) were retained as opposed to the 44 of the 54 participants (81.5%) retained in the SM group.

The 14-week exercise program was effective for improving the fitness performance scores of both the SM and the PM groups. Both groups demonstrated significant improvements ($p \leq .03$) for all fitness measures, including muscular strength and endurance, cardiovascular endurance, balance, agility, and flexibility. Consequently, it is reasonable to conclude that by the end of the 14-week intervention, SM and PM group participants experienced similar improvements in their physical fitness.

Pre- and postintervention data on perceived function, using the SF-36vr2, were collected for 87 PM and 44 SM group participants. Because of some missing answers in the SF-36vr2 questionnaire, varying numbers were obtained when computing the subscale and component scores. A summary of means of the SF-36vr2 subscale scores and component scores is provided in Table 3. At baseline, there were no significant differences between the PM and the SM groups on any of the subscale and component scores (all *p*s > .05). After the 14-week intervention, perceived physical, mental, and social functioning improved significantly ($p < .05$) for the PM group for all subscales except for bodily pain ($p = .20$). For the SM group, significant improvement was observed only for vitality ($p = .01$), while nonsignificant changes were observed on all other subscales (all *p*s > .06) (see Table 3).

Discussion

To be effective in promoting physical activity in older adults, NPs must be cognizant of individual and organizational factors that influence adherence (Rhodes et al., 1999) and tailor exercise prescription accordingly. Two

Table 3 Means (±SD) of % difference (100[Post − Pre]/Pre) of participants for subscales of SF-36 for the peer mentors (*n* = 87) versus student mentors (*n* = 44), with varying *n*'s because of missing values

	Peer mentored[a]		Student mentored[a]	
SF-36 subscale	*Means ± SD*	*p* Value for right tailed *t* test mean = 0	*Means ± SD*	*p* Value for right tailed *t* test mean = 0
Physical function (PF)	11.4 ± 22.8	<.0001	3.7 ± 21.7	.16
Role physical (RP)	10.2 ± 41.3	.01	8.0 ± 45.3	.13
Bodily pain	3.8 ± 41.3	.20	−2.7 ± 30.8	.71
General health (GH)	7.7 ± 15.8	<.0001	4.7 ± 21.7	.08
Vitality (VT)	10.5 ± 27.5	.0006	9.3 ± 23.0	.01
Social function (SF)	9.0 ± 35.5	.01	-1.0 ± 20.8	.62
Role emotional (RE)	6.9 ± 26.3	.01	8.0 ± 34.1	.07
Mental health (MH)	5.6 ± 22.6	.01	1.8 ± 21.7	.29
Physical component (PCS)	3.9 ± 14.9	.02	1.0 ± 13.9	.35
Mental component (MCS)	4.3 ± 17.3	.02	1.9 ± 12.3	.19

[a]Presented SM and PM group data are combined data from the first and second cohort of intervention participants.

emerging factors that improve adherence are availability of structured exercise programs for the older adult and peer mentoring.

Our findings indicate that PMs are successful and effective in physical fitness interventions for older adult participants despite PMs being new to physical fitness and the mentor role. In the present study, older adults who participated in a physical fitness program with peer support perceived (a) overall improvement in physical and mental well-being, (b) better social functioning, (c) enhanced ability to carry out physical and emotional roles, (d) improved general health, and (e) increased level of vitality. Thus, we conclude that peer-mentored exercise programs for older adults are superior to programs mentored by young professionals and may lead to increased exercise adherence. In addition, our results support previous findings of the effectiveness of structured exercise program for the elderly (Ho et al., 2007) and of peer mentoring in various clinical settings across diverse health conditions (Ashbury et al., 1998; Broadhead et al., 2002; Ezumi et al., 2003; Joseph et al., 2001; Lorig et al., 2001; Parent & Fortin, 2000; Williams et al., 2002).

In summary, NPs and other primary care providers need to be aware of the importance of peer support on exercise adherence for older adults. Healthcare practice must go beyond prescribing exercise to providing information on how to locate and access community resources for older adults that includes peer support.

Acknowledgments

This research was supported by the Ageless Health Initiative of the Paso del Norte Health Foundation and funded in part by the National Institutes of Health, National Center on Minority Health, and Health Disparities (Grant P 20 MD000548), a joint venture of The University of Texas at El Paso and The University of Texas Health Science Center at Houston School of Public Health. We thank Brian Carter for facilities support and all student and peer mentors who were involved in the intervention.

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